

BACKGROUND

Segnut has conducted multiple field trials using 1-1/4" Nuts on D10 Dozer Cutting Edge Blades. This application is one of the harshest in the industry as the nuts are located on the bottom of the blade - subject to wear and impacts from a variety of hard bulk materials. As such, it's not uncommon to see standard nuts significantly worn down and even missing. Tightening a bolted joint involves applying a torque to rotate the nut (or bolt head) which must overcome friction at both the thread and nut-washer interface before stretching the bolt to a desired tension. This tension is what clamps the joint together, providing the strength to take the impacts and forces applied to the joint. Variations in friction at the thread and nut-washer interface change the tension produced from a given applied torque. This tension can vary by approximately $\pm 35\%$. The plow bolt used in cutting edge blade applications is very short and thus only stretches a small amount when tensioned, this makes it sensitive to changes in joint length and susceptible to tension loss. It's therefore critical in this application that the correct tension is achieved during nut tightening to ensure joint robustness.

THE PROBLEM

Investigation into the cutting edge joint torque-to-tension relationship, testing both standard nuts and Segnuts, found that insufficient tension was being developed under certain conditions. Furthermore, inspection after testing indicated that the nut-washer interface was experiencing excessive friction. Conventionally, if friction was high on the top surface of the washer, rotation would occur on the bottom of the washer, however the dozer blade moldboard is often damaged and rough which prevents this from occurring.

SOLUTION

Using an extra washer enables rotation to occur between the two washers instead of between the nut-washer or washer-moldboard interfaces. This allows our rotation interface to be specifically designed to have consistent low friction, ensuring the correct tension is achieved. Each 1-1/4" Segnut is supplied with a Double Washer, sealed around the bearing surface to protect the rotation interface from damage/contamination.



DOZER CUTTING EDGE BLADE



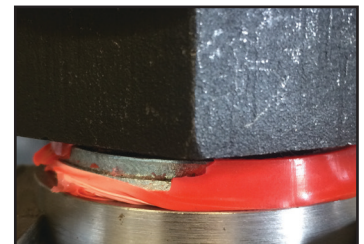
FASTENER ABRASION AND WEAR



GALLING AT NUT-WASHER INTERFACE



FULL BLADE INSTALLATION WITH DOUBLE WASHERS



**DOUBLE WASHER INCLUDED WITH 1-1/4" SEGNUT
KONNECT PART NO. SEG1.14NC9N2W**

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Email: engineering@segnut.com
Phone: +61 8 6245 2150